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Committee on the Peaceful Uses of Outer Space
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Matters relating to the definition and delimitation of outer space

The challenging context of considering all aspects of the delimitation of airspace and outer space: arguments for adding dialectical elements to, and setting new analytical trends in, discussion of the issue

Working paper submitted by the Russian Federation

1. The authority and responsibility of the Committee on the Peaceful Uses of Outer Space as regards finding a solution to the issue of the delimitation of airspace and outer space were clearly defined decades ago. Nevertheless, the Committee has been unable to make significant progress on the matter. It is evident that States do not share a common view of the ability of the Committee to achieve agreement in this field. Perhaps the "ideology of delimitation" has become a spent force and can easily be dispensed with in the light of current and expected developments in the use of aerospace transportation systems. Perhaps the Committee is handling the topic in a markedly conservative way while the entrenched set of traditional views of the problem has become obsolete and has ceased to reflect reality. That is not so. No doubt a fresh approach to the topic is needed, especially considering that it would be erroneous to assert that the very idea of the delimitation of airspace and outer space is losing its relevance and is not supported by practical needs. As for the modalities of addressing the issue, there is certainly room for improvement. The Committee should define a set of logical steps that could effectively improve the process of developing solutions to the problems posed by delimitation.

2. What could be the determinants of success in intensifying work in this field? First of all, the Committee should take measures to ensure that capacity to apprehend the problem at a higher intellectual level is not diminished. This means overcoming indecisiveness in identifying new lines of inquiry, and inertia with respect to understanding of the topic, through more active discussions and involvement in analytical work. To a certain extent, the initiative of the World Meteorological Organization (WMO) to develop a kind of "sectoral" definition of "space" (in line with the Organization's remit) affords the opportunity to formulate, within the

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framework of the Committee, entirely appropriate considerations that build on delimitation perspectives and, perhaps, to ensure a more manifest commitment to addressing the various practical facets of the topic. The delimitation issue should be viewed as reflecting a complex interplay of factors shaped by a variety of interests and the combination of a range of pressures.

3. It should be noted that WMO, in presenting to the Committee in summarized form information on its intention to adopt a definition of "space", was not explicit in explaining the circumstances that had led to its decision. In fairness, the idea of defining "space" has not turned out to be sufficiently self-evident. Rather, it seems to be elusive in the sense that it is practically impossible to identify its merits in the specific context of the tasks facing WMO, whichever area of its activities is considered. For example, the proposed definition has no connection whatsoever with the study of factors influencing space weather and their impact on climate, atmospheric processes and human life, which are within the purview of WMO.

4. Not only was the presentation of the WMO proposal to the Committee vague but, also, WMO did not seek the opinion of the Committee or its Legal Subcommittee. The authors of the initiative should have indicated their interest in establishing an interactive relationship with the Committee. The delegation of the Russian Federation at the sixty-ninth session of the Executive Council of WMO drew this situation to the attention of the WMO secretariat. The issue of the definition of "space" was withdrawn from the agenda of the session in accordance with WMO procedures. Such a decision can only be welcome. It is important to understand that the problem lies not in the absence of a desire on the part of States to rely on innovative and pragmatic approaches elaborated for practical purposes but in the need to take into account the various contexts in which the issue of delimitation and the definition of space are considered. This does not mean that WMO might not be in a position to determine the possible scope of its authority — or even establish its exclusive competence — to address, directly in relation to the subjects that its work covers, specific issues that might somehow be related to the delimitation and definition of outer space. It is evident, however, that the Organization should make a strong case for those of its proposals that are introduced in connection with a topic that falls within the purview of the Committee's mandate.

5. As indicated in document A/AC.105/1112/Add.2, WMO recognizes that settlement of the issue of definition and delineation of outer space will have legal implications. This, according to WMO, explains why the Committee has been considering this topic for many years. At the same time, the definition of outer space proposed by WMO itself almost inevitably leads to the conclusion that a boundary can be established and that it should be at the upper boundary of the mesosphere (i.e., at an altitude of 80–90 km). The problem is not the specific altitude (although that altitude is different from the ranges proposed earlier by States — for instance, 100–110 km). The real problem is that the definition of "space" proposed by WMO will, if adopted (including as part of the WMO Technical Regulations), create a rather risky precedent. As a result, political factors will take hold, causing the single topic of delimitation of airspace and outer space to be broken up and divided among different specialized agencies of the United Nations. It is noteworthy that in this specific case WMO does not use the term "airspace" and does not refer at all to the delimitation of airspace and outer space. If technical and legal decisions regarding the airspace boundary were similarly left solely to the International Civil Aviation Organization (ICAO) (within its exclusive competence), the situation would very likely develop according to a geopolitical scenario.

6. The World Health Organization (WHO) expressed the opinion (A/AC.105/1112/Add.2) that the definition and delimitation of outer space was necessary for the elaboration of appropriate legislation or regulations related to public safety and suborbital flights. Moreover, in document A/AC.105/1039/Add.8, WHO stated that the definition of outer space would be essential in the context of the protection of the health of travellers on suborbital spaceflights, as well as in defining on-board health and safety requirements and related essential medicines and medical

devices. These statements raise a number of questions. In particular, with regard to air quality issues, it follows from the document "WHO air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide: global update 2005 — summary of risk assessment" that in this context the matter concerns only the surface layer of the atmosphere at altitudes at which a human being can breathe without special equipment. If suborbital flights are the focus, the delimitation of airspace and outer space is neither justified nor necessary from the perspective of protection of human health, because in order to obtain the required estimates of accumulated dose of radiation and determine other physical parameters on the basis of which the degree of risk that such a flight involves is evaluated, the physical characteristics (physical models) of the environment through which an aircraft passes should be taken into account, and in that case it makes no difference how that environment is formally named. Such models are already available and are being reviewed within the framework of the WMO Interprogramme Coordination Team on Space Weather. WHO could use those models to calculate the physical parameters of the environment that are required in order to assess human health risk factors.

7. There is a risk that different specialized agencies of the United Nations system might establish definitions of both "space" and "airspace" and define elements of the regulation of suborbital flights, indeed, even elements of the concept of space traffic management. If this happens, some stakeholders will inevitably seek to portray such basic definitions and concepts elaborated outside the Committee as essentially reflecting the views of the entire international community. That in turn will raise the question as to whether there are objective grounds for preserving the mandate of the Committee with regard to the delimitation and definition of outer space.

8. It seems plausible to argue that any initiative that provides for separate solutions with regard to the definition and delimitation of airspace and outer space may, for objective reasons, be viewed as directly related to the topic of space traffic management. More specifically, from a political perspective, such initiatives seem to promote the idea of establishing an additional "stratum" (zone) between airspace and outer space for the purposes of suborbital flights that would be exempt from the provisions of space law that include the crucially important ban on placing in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapon of mass destruction. The idea of a "stratum" has been circulating only in expert circles to date. At the same time, political developments increasingly confirm that considerable efforts and resources are being devoted to supporting the risky idea of an expedited transition to space traffic management. Both experts and politicians should be cautious in defining a hypothetical context of research on the space traffic management issue and mindful of the considerable difficulties that such a path might pose.

9. Somehow the Committee has become caught up in discussing only civilian applications of new-generation transportation vehicles, for example, for tourism. Sooner or later this idyllic way of thinking will have to change. What about practical issues of safety and security? It is obvious that the possibility of power projection using such new-generation vehicles is no longer purely hypothetical. If the Committee wishes to ensure that its activities reflect political realities, it should, when addressing the delimitation issue, engage in addressing the challenging task of identifying all facets of regulation or, at least, present forecasts representing an important step in the analysis of all potential safety and security issues involved. Those States that consider themselves to hold well-founded views on the concept of space traffic management, and States that may be sympathetic to or supportive of the idea of a new "stratum", should demonstrate courage and come forward with ideas as to the basic norms that might govern activities in this hypothetical area and that organically reflect the wide spectrum of issues related to security and strategic stability.

10. The International Telecommunication Union (ITU) would, for objective reasons, be interested in finding an answer to the question as to the stages of a suborbital flight of an aerospace transportation vehicle at which that vehicle's radioelectronic equipment (receivers/transmitters) could be subject either to the provisions of the

Radio Regulations pertaining to terrestrial radiocommunication services (in particular, services that regulate aircraft radiocommunication) or to the provisions of the same Regulations related to space radiocommunication services. During the flight of a launch vehicle, including the suborbital part of the trajectory, the functioning of the vehicle's radioelectronic equipment (and, as the case may be, of its payload) is subject to the provisions of the Radio Regulations related to space operation services. The Radio Regulations recommend using satellite radiocommunication services at altitudes above 100 km despite the fact that the minimal altitude of the perigee of a highly elliptical orbit may be less than 100 km. Given that the maximum altitude of suborbital flight may significantly exceed 100 km, it would certainly be of interest to understand what functional solutions to the problem of applying the provisions of the Radio Regulations could be proposed with respect to such flights. It would be logical to assume that an aerospace vehicle performing a suborbital flight which starts from the Earth's surface or from airspace might well be served by aeronautical radiocommunication services up to a certain altitude and subsequently by satellite radiocommunication services. In the same way, an aerospace vehicle that performs a suborbital flight in outer space could be effectively supported by satellite radiocommunication services and, below a certain altitude, by aeronautical radiocommunication services. Therefore, ITU might find it appropriate and acceptable to set a boundary at a certain altitude that would separate two zones: one where terrestrial radio services would be used and one where space radio services would be used. However, the establishment of such a boundary has nothing to do with the delimitation and definition of airspace and outer space. There is no evidence of any real need to introduce changes to the Radio Regulations with the specific aim of regulating the use of the radioelectronic equipment of suborbital objects.

11. Trust-building measures should be key to the establishment of a behavioural model, and that being the case, can be implemented only with honest intentions. Otherwise, it is unlikely that positive and trust-based relations can be built between States. Therefore, when dealing with such issues as the delimitation of airspace and outer space, States should facilitate open discussions and the candid exchange of views on all possible aspects of the topic.